ECONOMY OVENS

SMO1E SMO1E-2
SMO3E SMO3E-2
SMO5E SMO5E-2

PREVIOUSLY DESIGNATED AS

1321F 1321F-2
1325F 1325F-2
1327F 1327F-2

INSTALLATION AND OPERATION MANUAL

Revised 12/2013
4861659

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This unit is a special purpose oven for professional, industrial or educational use where the preparation or testing of materials is done at approximately atmospheric pressure and no flammable volatile or combustible materials are being heated or placed near or on top of unit. This unit is not intended for hazardous or household locations or use.

Section 1

RECEIVING AND INSPECTION

Your satisfaction and safety require a complete understanding of this unit, including its proper function and operational characteristics. Read the instructions thoroughly and be sure that all operators are given adequate training before attempting to put the unit in service. Note: This equipment must be used only for its intended application; any alterations or modifications will void your warranty.

1.1 **Inspection:** The carrier, when accepting shipment, also accepts responsibility for safe delivery and is liable for loss or damage claims. On delivery, inspect for visible exterior damage, note and describe on the freight bill any damage found and enter your claim on the form supplied by the carrier.

1.2 Inspect for concealed loss or damage on the unit itself, both interior and exterior. If any, the carrier will arrange for official inspection to substantiate your claim.

1.3 **Return Shipment:** Save the shipping carton until you are sure all is well. If for any reason you must return the unit, first contact your customer service representative for authorization, and supply data plate information including serial number. Please see the manual cover for information on where to contact customer service.

1.4 **Accessories:** Verify that all of the equipment indicated on the packing slip is included with the unit. Carefully check all packaging before discarding. Each unit is equipped with 2 shelves, 8 shelf clips, a thermometer and thermometer clip.

Section 2

GRAPHIC SYMBOLS

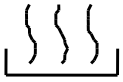
Your oven is provided with a display of graphic symbols to help in identifying the use and function of the available adjustable components.

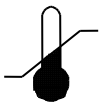
2.1 This symbol, when shown, indicates that you should consult your manual for further description or discussion of a control or user item.

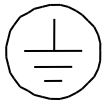
2.2 Indicates **"AC Power"**

2.3 Indicates **"Adjustable Temperature"**

2.4 Indicates **“Manual Control”**

2.4  Indicates **"Heating"**

2.5  Indicates **"Over Temperature"**

2.6  Indicates **“Protective Earth Ground ”**

2.7 Indicates **“Potential Shock Hazard”**

2.8 Indicates “**Unit should be recycled”** (Not disposed of in land-fill)

Section 3

INSTALLATION

Local city, county, or other ordinances may govern the use of this equipment. If you have any questions about local requirements, please contact the appropriate local agency. Installation may be performed by the end user.

Under normal circumstances this unit is intended for use indoors, at room temperatures between 5° and 40°C, at no greater than 80% Relative Humidity (at 25°C) and with a supply voltage that does not vary by more than 10%. Customer service should be contacted for operating conditions outside of these limits.

3.1 **Power:** The power source must match the voltage, cycle, phase and ampere requirements listed on the data plate (located just above the power cord on the back side of the oven). The unit is intended for 50/60 HZ application. Make sure your power supply matches that shown on the data plate. VOLTAGE SHOULD NOT VARY MORE THAN 10% FROM THE DATA PLATE RATING. A separate circuit is recommended to preclude loss of product due to overloading or circuit failure. Note that the electrical supply to the unit must conform to all national and local electrical codes.

3.2 **Location:** When selecting a site for the oven, consider conditions that may affect performance, such as heat or cold from air vents, fast moving air currents, other ovens, autoclaves, direct sun, etc. Avoid high traffic areas that may reduce accessibility to the oven and allow at least 20cm between the unit and surrounding walls or partitions that might obstruct free airflow.

3.3 **Lifting/Handling:** These units are heavy and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. Units should only be lifted from their bottom surfaces. Doors, handles, and knobs are not adequate for lifting or stabilization. The unit should be completely restrained from tipping during lifting and transport. All moving parts, such as shelves and trays should be removed and doors need to be positively locked in the closed position during transfer to prevent shifting and damage.

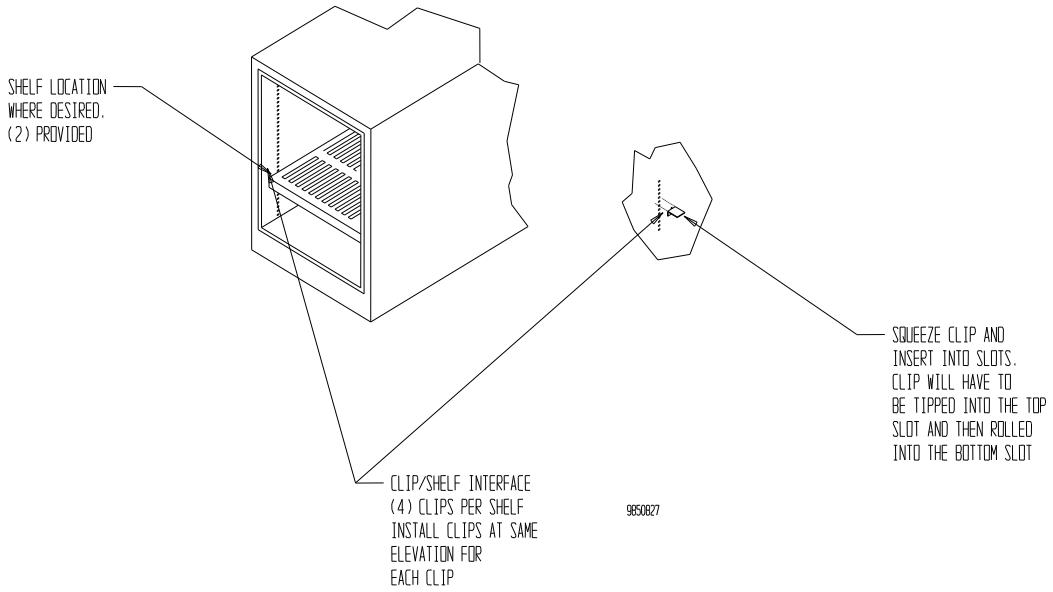
3.4 **Leveling:** The unit must sit level and solidly. The oven is equipped with non-adjustable rubber feet to raise it off the counter and prevent sliding; however, the counter must be level to provide optimum working and safety conditions.

3.5 **Cleaning:** The oven was cleaned at the factory, but not sterilized. Remove all interior parts, including shelves and shelf clips. If assembled and clean the inside of the chamber thoroughly with a disinfectant that is appropriate for your application. DO NOT USE chlorine-based bleaches or abrasive cleaners, as they will damage the ovens interior surfaces. DO NOT USE spray cleaners that might leak through openings and cracks and get on electrical parts or that may contain solvents that will harm coatings. A regular periodic cleaning is recommended.

WARNING: Never clean the unit with alcohol or flammable cleaners with the unit connected to the electrical supply. Always disconnect the unit from the electrical service when cleaning and assure all volatile or flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

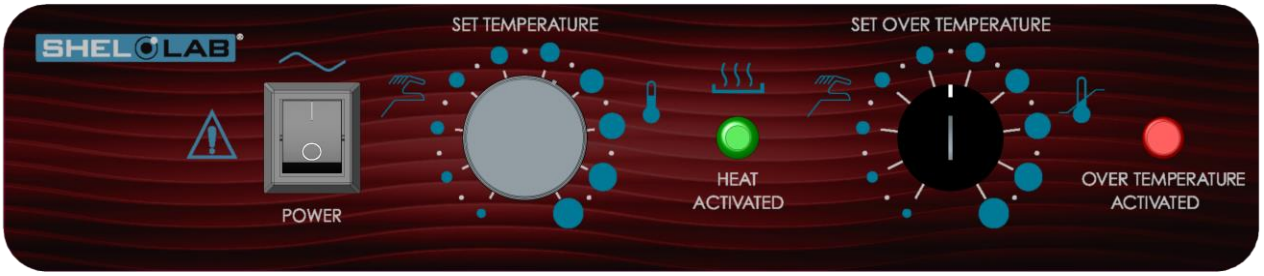
3.6 Shelves: Place shelves in the chamber at desired position. See **Figure 1**.

Figure 1



Section 4

CONTROL PANEL OVERVIEW



4.1 **Power Switch:** The main power I/O (on/off) switch controls all power to the oven. It must be in the I or ON position before any systems are operational.

4.2 **Main Temperature Controller:** Marked SET TEMPERATURE, this control is equipped with an adjustment knob and a graduated dial. The graduated dial is marked with 10 major increments. The increments can be used as index points for setting and returning to set point temperatures.

4.3 **HEATING light:** This green pilot light is marked HEAT ACTIVATED and indicates when the element has been activated and the oven is heating. When set point is reached the pilot light will cycle on and off as the elements maintain the temperature selected.

4.4 **Over Temperature Thermostat:** Marked SET OVERTEMPERATURE, this control is completely independent of the Main Temperature control and is equipped with an adjustment knob that requires a flat-edged tool when making adjustments to eliminate accidental changes. It provides safety temperature protection for the oven. If for any reason the oven temperature rises above the Main Temperature control's set point, the Over Temperature Thermostat will limit the rise to approximately 10°C above the set point selected.

4.5 **Over Temperature light:** This red pilot light is marked OVERTEMPERATURE ACTIVATED and is on when the Over Temperature Thermostat has been activated and taken control of the elements. Under normal operating conditions this pilot light should never be on.

Section 5

PRECAUTIONS

This unit has been designed with a dampered vent from the chamber. In order to work effectively and safely, some precautions will need to be taken by the operator.

5.1 **The bottom surface of the chamber should not be used as a work area.**

5.2 In most applications, the exhaust damper will need to be open during drying or degassing for best results.

5.3 **THIS OVEN IS NOT AN EXPLOSION PROOF OVEN AND IS NOT DESIGNED TO HANDLE COMBUSTIBLE GASSES. Do not place explosive, combustible or flammable materials into the chamber.**

5.4 Some of the out-gassed byproducts may be hazardous or unpleasant to operating personnel. If this is the case, the exhausts should be positively ventilated to the outside and dealt with according to local regulations. Your dealer can provide you with a power exhaust that greatly helps under these applications.

5.5 Do not place sealed or filled containers in the oven chamber.

5.6 This oven is NOT designed for use in Class I, II, or III locations as defined by the National Electrical Code.

5.7 This oven is not intended, nor can it be used, as a patient connected device.

Section 6

OPERATION

6.1 **Power Supply:** The power supply must be properly grounded (earthed) and correctly sized to match the unit data plate rating. The supply voltage must match the data plate voltage within 10%. If supplied with a detachable cord set, plug the female end into the inlet on the unit and the male plug into the supply. Assure that units requiring a fuse have a fuse installed.

6.2 Push the power switch to the ON position and turn the Over Temperature Thermostat to its maximum position, clockwise so it will not interrupt the setting of the Main Temperature control.

6.3 Place the reference thermometer through the exhaust port on top of the unit; a clip is provided with your accessory package. See **Figure 3** on the following page.

6.4 **Setting Main Temperature:** The operating range for this oven is ambient room temperature + 5°C to 200°C. To set the Main Temperature Controller turn the knob to the desired oven temperature, using the graduated dial as a reference guide. Allow one hour for the temperature to stabilize. Using the reference thermometer, verify the oven temperature; if it is not at the desired value, turn the control knob up or down as needed. Allow the temperature to re-stabilize, continuing the process until the exact desired temperature is achieved.

Note: Slight vapor or smoke may occur in the initial heat-up. This is a normal occurrence when the oven is first brought up to temperature and protective coatings on the element become hot.

6.5 **Setting Over Temperature:** As stated in earlier, the Thermostat should be set to its maximum position. Now turn the control knob counterclockwise just until the OVERTEMPERATURE ACTIVATED light comes on. Next, slowly turn the control knob clockwise just until the light goes off. Then turn the control knob clockwise two (2) minor scale divisions past the point where the light went out. The Over Temperature Thermostat should now be set at approximately 10°C above the Main Temperature set point. Note that it is not recommended that the unit be allowed to operate using the Over Temperature Thermostat as the temperature controller for an extended period of time. See the Troubleshooting section if the Thermostat is activated.

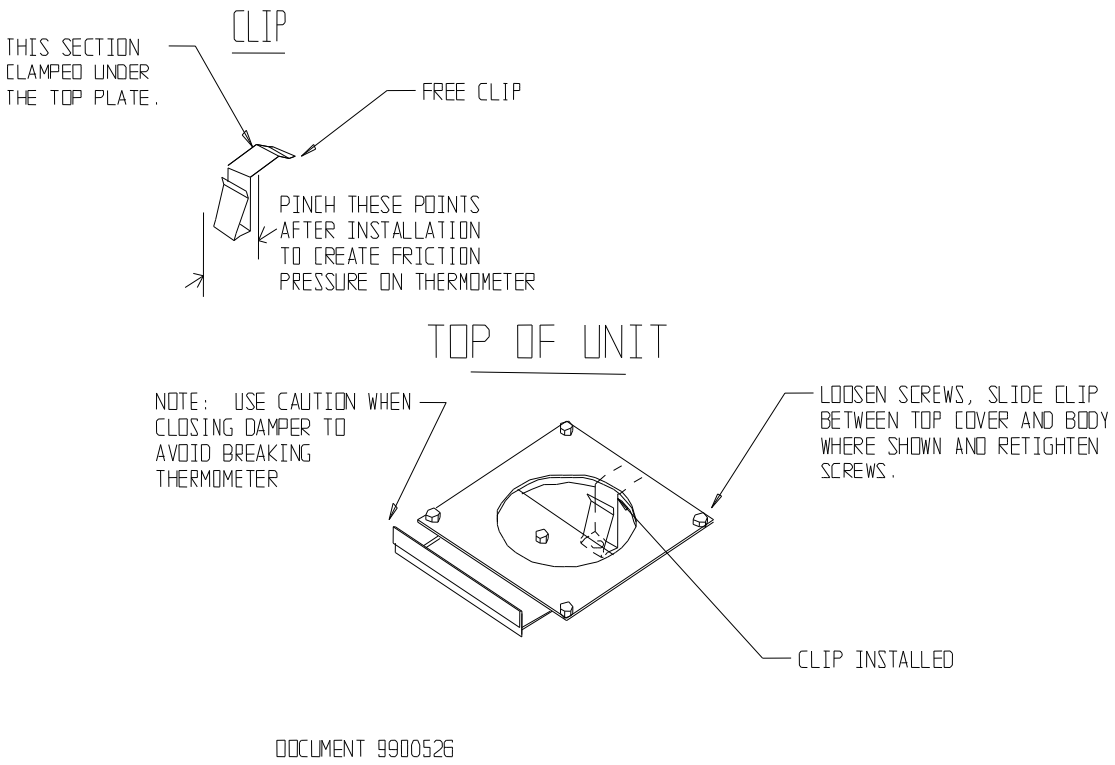

PLACEMENT OF NEW THERMOMETER CLIP
CLIP
THIS SECTION CLAMPED UNDER THE TOP PLATE.
FREE CLIP
PINCH THESE POINTS AFTER INSTALLATION TO CREATE FRICTION PRESSURE ON THERMOMETER
TOP OF UNIT
NOTE: USE CAUTION WHEN CLOSING DAMPER TO AVOID BREAKING THERMOMETER
LOOSEN SCREWS, SLIDE CLIP BETWEEN TOP COVER AND BODY WHERE SHOWN AND RETIGHTEN SCREWS.
CLIP INSTALLED
DOCUMENT 9900526

Figure 3

Section 7

MAINTENANCE

Note: Prior to any maintenance or service on this unit, disconnect service cord from the power supply.

7.1 **Cleaning:** Clean the oven interior on a regular basis. When washing interior of unit, handle gasket carefully so as not to impair the positive seal. Clean the inside of the chamber thoroughly with a disinfectant that is appropriate for your application. Make sure to rinse the cleaned surface with a damp cloth. DO NOT USE chlorine-based bleaches or abrasive cleaners, as they will damage the oven chamber. DO NOT USE spray cleaners that might leak through openings and cracks and get on electrical parts or that may contain solvents that will harm coatings.

WARNING: Never clean the unit with alcohol or flammable cleaners with the unit connected to the electrical supply. Always disconnect the unit from the electrical service when cleaning and assure all volatile or flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

7.2 **Storage:** If the unit is to be shut down for an extended period of time, wipe the chamber clean and let dry before closing door to eliminate possibility of contamination. If the unit is to be transported, remove shelving and trays, clasp the door shut and disconnect the power supply. Please refer to Section 3.3, Lifting / Handling for further direction.

7.3 No maintenance is required on the electrical components. If oven fails to operate as specified please review Troubleshooting prior to calling customer service.

Section 8

TROUBLESHOOTING

TEMPERATURE	
Temperature too high	
	1/ controller set too high 2/ controller failed on – *call Customer Service*
Chamber temp spikes over set point and then settles to set point	
	Recalibrate – *see section 6.3 and 6.4*
Temperature too low	
	1/ Thermostat set too low – *see section 6.5* 2/ controller set too low – *see section 6.4* 3/ unit not recovered from door opening – *wait for heating indicator to turn off* 4/ unit not recovered from power failure or being turned off – *oven will need 1 hour to warm up and stabilize*
Unit will not heat up at all	
	1/ verify that controller is asking for heat by looking for heating indicator light – *if pilot light is not on continuously at initial start up, there is a problem with the controller* 2/check amperage – *amperage should be virtually at maximum rated (data plate) amperage* 3/ is the Thermostat set high enough? – *for diagnostics, should be fully clockwise with the pilot light never on* 4/ has the fuse/circuit breaker blown?
Will not maintain set point	
	1/ assure that set point is at least 5 degrees over ambient room temperature. 2/ see if ambient is fluctuating
MECHANICAL	
Door not sealing	
	1/ Confirm that the door gasket is aligned properly. 2/ Confirm that unit has not been damaged and that the body is square.
OTHER	
Unit or wall fuse/circuit breaker is blown	
	1/ check wall power source 2/ compare current draw and compare to specs on data plate 3/ see what other loads are on the wall circuit
Unit will not turn on	
	1/ check wall power source 2/ check fuse/circuit breaker on unit or in wall
Unit is smoking – out of box	
	Put unit under vent and run at full power for one hour.

SECTION 9

PARTS LIST SMO1E / SMO1E-2

(1321F / 1321F-2)

Description	115V	220V
Cord Set – European	N/A	1800500
Cord Set – USA	1800510	1800539
Door Gasket	3450722	3450722
Door Handle	3800610	3800510
Fan	2600502	2600502
Fan Blade	2600545	2600545
Filter	2800502	2800502
Fuse	3300516	3300515
Fuse Holder	N/A	3300501
Heating Element	9570746	9570802
Inlet with Fuse Drawer	4200505	4200505
Knob, Main Temperature	4450528	4450528
Knob, Over Temperature	4450506	4450506
Main Temperature Controller	1750863	1750863
Motor	4880527	4880528
On/Off (I/O) Switch	7850570	7850570
Over Temperature Thermostat	1750615	1750648
Pilot Light, green	4650554	4650554
Pilot Light, red	4650553	4650553
Shelf Clips	1250511	150511
Shelf	5080539	5080539
Thermometer	8200509	8200509
Thermometer Clip	5080865	5080865

UNIT SPECIFICATIONS

Weight

Unit	Shipping	Net
SMO1E SMO1E-2 (1321F 1321F-2)	67 lbs.	60 lbs.

Temperature

Unit	Range	Uniformity
SMO1E SMO1E-2 (1321F 1321F-2)	Amb+5° to 200°C	±4°C

Dimensions

Unit	Exterior WxDxH (in)	Interior WxDxH (in)
SMO1E SMO1E-2 (1321F 1321F-2)	21.75 X 19 X 24	17 X 10.5 X 16.75

Capacity

Unit	Cubic Feet
SMO1E SMO1E-2 (1321F 1321F-2)	1.73

PARTS LIST SMO3E / SMO3E-2

(1325F / 1325F-2)

Description	115V	220V
Main Temperature Control	1750863	1750863
Over Temperature Control	1750615	1750648
Cord Set	1800506	1800539
Door Handle	3800610	3800610
Heating Element	9570777	9570804
On/Off Switch	7850570	7850570
Knob Main Temperature	4450528	4450528
Knob Over Temperature	4450506	4450506
Pilot Light Green	4650554	4650554
Pilot Light Red	4650553	4650553
Shelf Clips	1250511	1250511
Shelf	5500629	5500629
Thermometer Clip	5080865	5080865
Thermometer	8200509	8200509
Fan Motor	4880527	4880528
Fan Blade 3”	2600545	2600545
Fan Blade 4.75”	2600502	2600502
Filter EMI	2800502	2800502
Fuse	3300516	3300515
Inlet with Fuse Drawer	4200505	4200505
Fuse Holder	N/A	3300501

UNIT SPECIFICATIONS

Weight	Shipping	Net
SMO3E SMO3E-2 (1325F 1325-2)	125 lbs.	85 lbs.

Dimensions	Exterior WxDxH	Interior WxDxH
SMO3E SMO3E-2 (1325F 1325-2)	20.5 X 25.25 X 31.5”	16 X 17.5 X 22”

Capacity	Cubic Feet
SMO3E SMO3E-2 (1325F 1325-2)	3.6

Temperature	Range	Uniformity
SMO3E SMO3E-2 (1325F 1325-2)	Amb+5° to 200°C	±4°C

PARTS LIST SMO5E / SMO5E-2

(1327F / 1375F-2)

Description	115V	220V
Main Temperature Control	1750863	1750863
Over Temperature Control	1750615	1750648
Cord Set	1800516	1800537
Door Handle	3800610	3800610
Heating Element 1327F	9570778	N/A
On/Off Switch	7850570	7850570
Knob Main Temperature	4450528	4450528
Knob Over Temperature	4450506	4450506
Pilot Light Green	4650554	4650554
Pilot Light Red	4650553	4650553
Shelf Clips	1250511	1250511
Shelf	5130714	5130714
Thermometer Clip	5080865	5080865
Thermometer	8200509	8200509
Filter EMI	2800502	2800502
Fuse	3300516	3300515
Inlet with Fuse Drawer	4200505	4200505
Fuse Holder	N/A	3300501

UNIT SPECIFICATIONS

Weight	Shipping	Net
SMO5E SMO5E-2 (1327F 1327F-2)	153 lbs.	113 lbs.

Dimensions	Exterior WxDxH	Interior WxDxH
SMO5E SMO5E-2 (1327F 1327F-2)	24 X 24.5 X 37”	20 X 17.5 X 28”

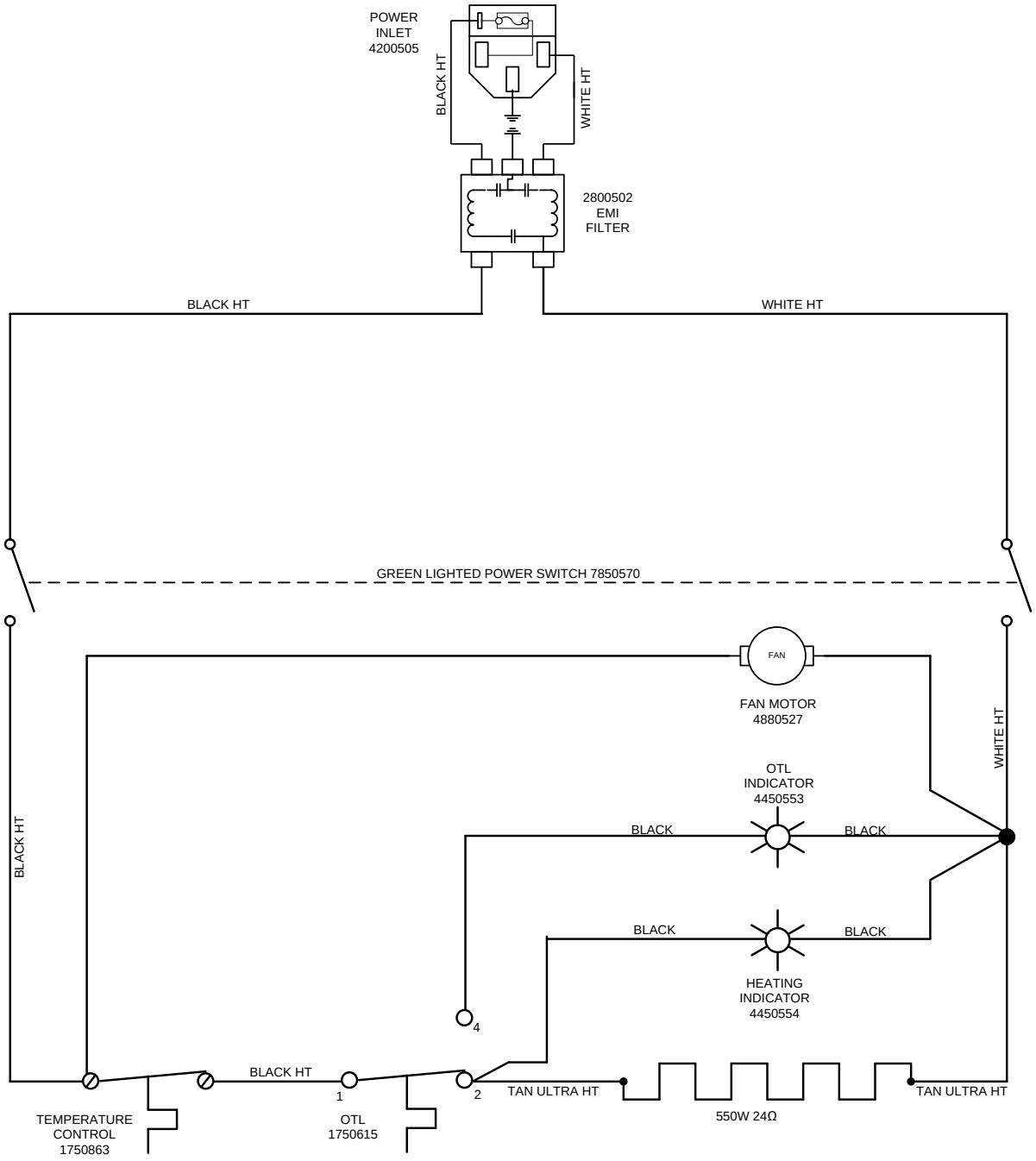
Capacity	Cubic Feet
SMO5E SMO5E-2 (1327F 1327F-2)	5.7

Temperature	Range	Uniformity
SMO5E SMO5E-2 (1327F 1327F-2)	Amb+5° to 200°C	±4°C

WIRE DIAGRAMS

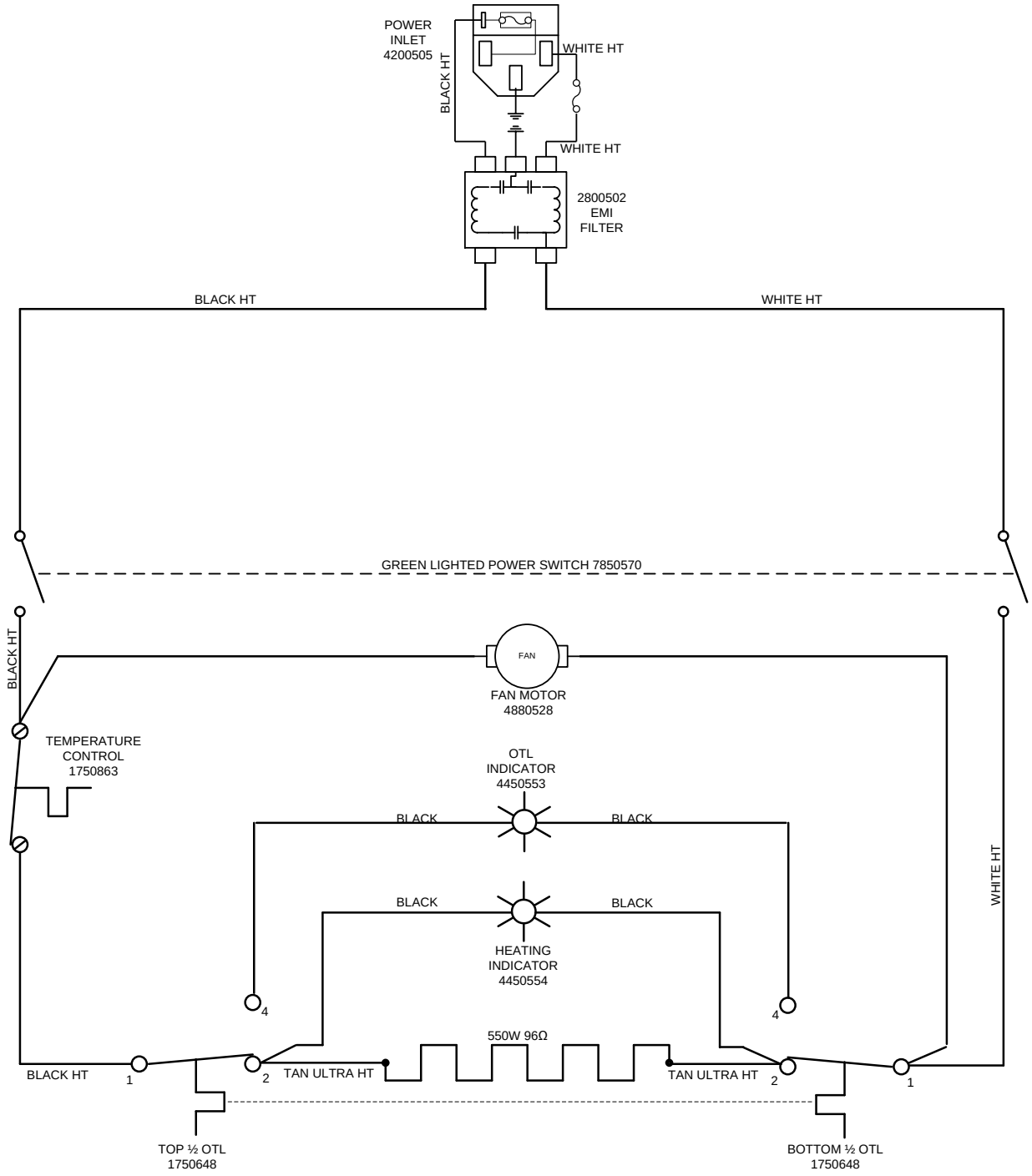
SMO1E (1321F) 100-120V

9851479



SMO1E-2 (1321F-2) 220-240V

9851480



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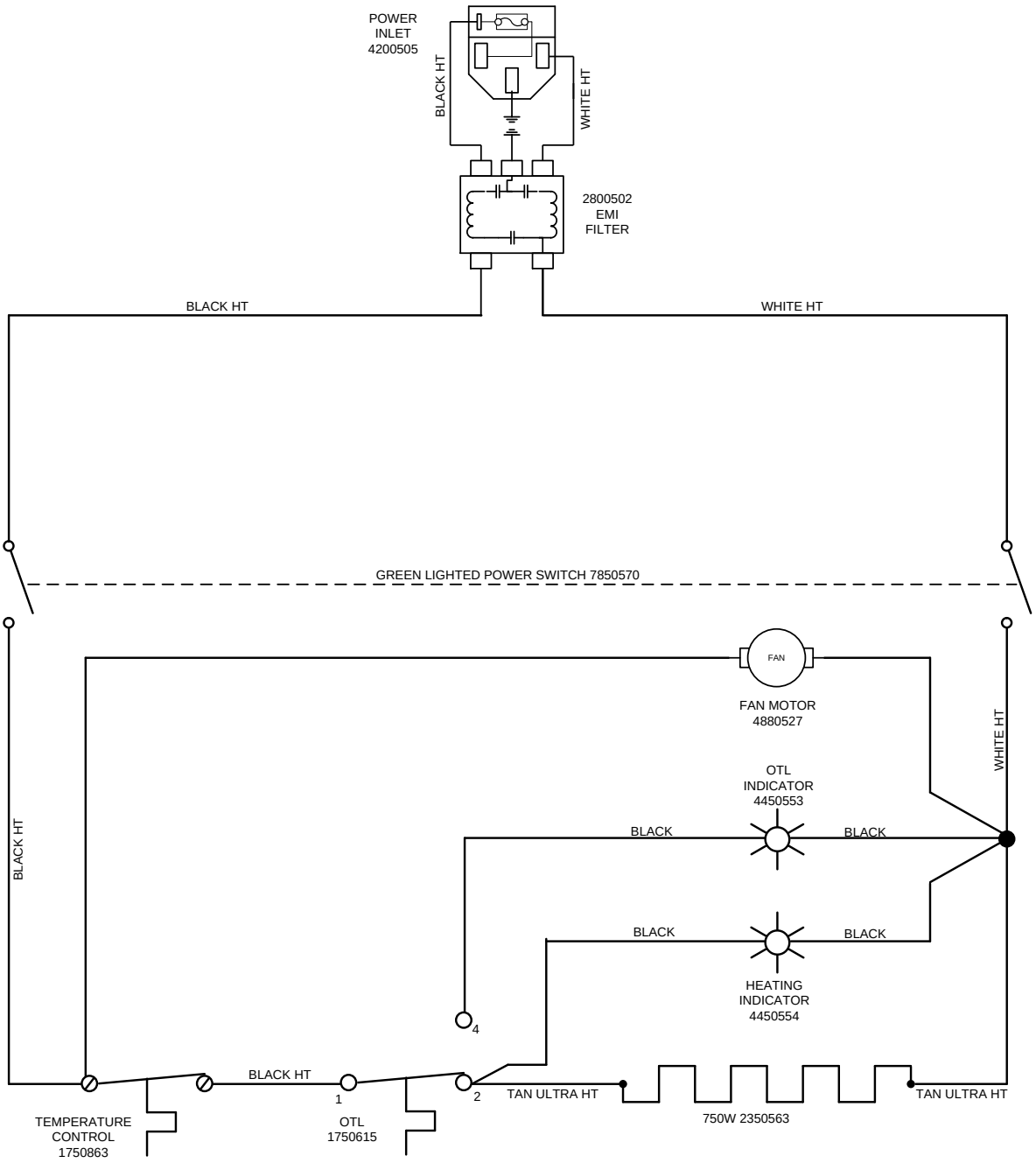

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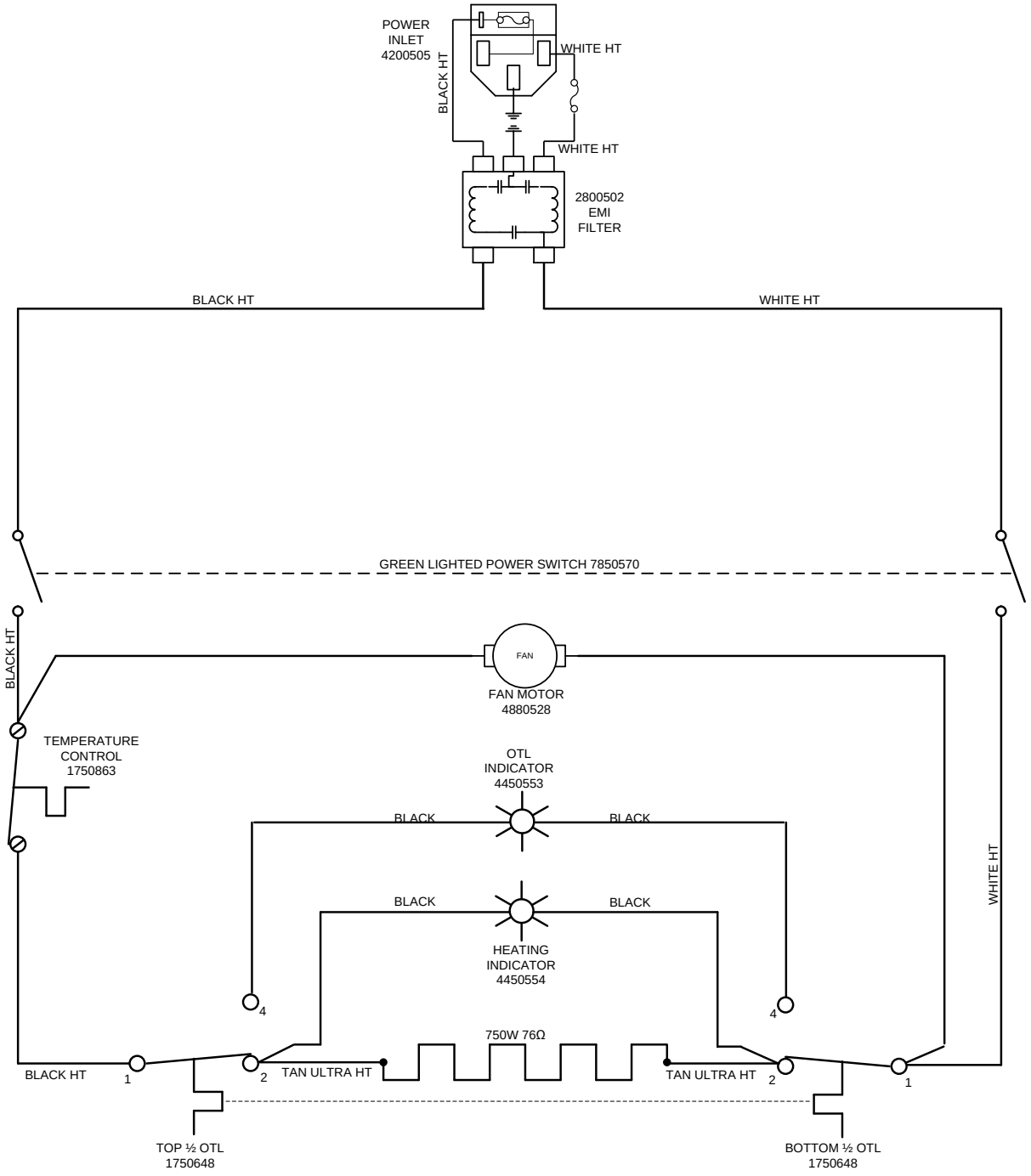

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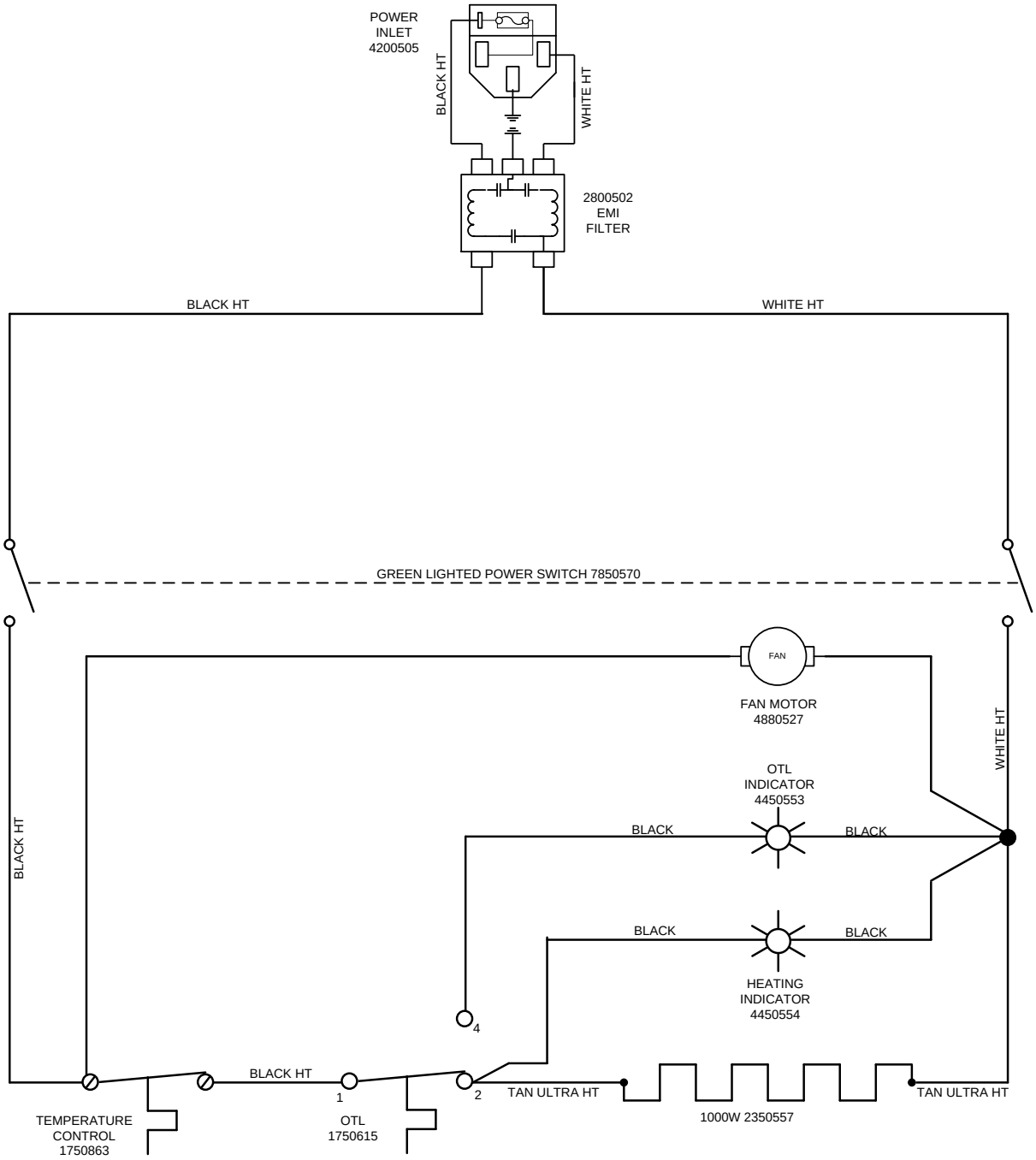

SMO5E-2 (1327F-2) 220-240V

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